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July 30*th.*

MR. VAUX, Vice-President, in the Chair.

Sixteen members present.

The following was presented for publication:

" Notes on certain Birds from New Grenada, with Descriptions of New Species." By Geo. N. Lawrence.

The following gentlemen were elected members:

Henry C. Gibson, Chas. Gibson, Andrew M. Moore, John Gibson and T. Brantly Langdon.

On favorable report of the Committee, the following paper was ordered to be published:

The Necessity and Velocity of Nebular Rotation.

BY J. ENNIS.

If matter were universally diffused through all space, the supposition would not be in accordance with experience, that this diffusion would be perfectly uniform and even. Such is not the result of natural processes in the actual world. The waters of the ocean are not perfectly uniform; their densities being varied by temperature and saline ingredients. The air is not uniform, nor the vapor of water in the air. Therefore, if matter were universally diffused, and contraction were to ensue, then the rarer portions would gather around the denser, and the expanded vapor would break up into separate huge irregular masses, like the clouds when the vapor of the atmosphere is contracting.

On the surfaces of these separate nebulous masses we can conceive of four sources of motion; the first only hypothetical, and the other three absolutely necessary.

First source of motion. In this general diffusion of matter, the supposition would be unnatural that all was perfectly motionless and still. A state of absolute repose might, for aught we know, be possible, but it would be a strange and unheard of assumption. How unlikely that the causes which spread matter abroad so widely should stop entirely, and leave no motion! Therefore every nebula in its beginning was probably endowed with some movements.

Second source of motion. When separate nebulous masses were formed by the ordinary principles of contraction and condensation, we cannot suppose they would be stationed at equal and symmetrical distances from one another, any more than we see among the white clouds which float together across the clear blue sky. Neither would they be of equal size, for the heavenly bodies, like the clouds, are very unequal in size. Therefore, by the force of gravity, the smaller would fall into the larger; and often two or three near together, though of similar size, would fall into one another. But any one could never fall directly toward the centre of gravity of another; because every approaching pair would be more or less under the influence of other neighboring nebulæ. Therefore, in striking each other obliquely, and not in the direction of their centres of gravity, a rotation must result. These collisions must have been a thousand times more numerous than the fall of meteors now, and so they would continue until space became cleared of all small and neighboring masses, and nothing remained but large and vastly distant nebulæ, each one of which is now represented by a great STELLAR SYSTEM, containing countless numbers of fixed stars.

Third source of motion. By the assumption of the nebular theory, as understood by myself, the contraction of a nebula was always much more slow than would be due to gravity. Therefore gravity would make the nebula round,